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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/811,523 | 03/29/2004 | Chad E. Mitchell | HSJ920030162US1 (HITG.059) | 1928 |
| 51298 | 7590 | 05/18/2005 | EXAMINER | |
| CRAWFORD MAUNU PLLC 1270 NORTHLAND DRIVE SUITE 390 ST. PAUL, MN 55120 | | | MERCEDES, DISMERY E | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2651 | |

DATE MAILED: 05/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/811,523

Applicant(s)

MITCHELL ET AL

Examiner

Dismery E. Mercedes

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 29 March 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-7,10-15,17-20,23 and 24 is/are rejected.
- 7) ☐ Claim(s) 3,8,9,16,21 and 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1,2,4-7,10-15,17-20, 23-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Ziporovich (US 5,737,342).

As to Claim 1, Ziporovich discloses a digital-to-analog converter (DAC) circuit (as depicted in FIG.1, “30-34”) including a variable gain amplifier (VGA) (as depicted in FIG.1, “20”), the DAC circuit providing digital outputs at an analog-to-digital converter (ADC) (as depicted in FIG.1, “26”) in response to read signal analog inputs and DAC digital inputs; and a controller, coupled to the DAC circuit, for determining read head channel amplitude based upon programming of the DAC, code received from the ADC and gain code obtained from the VGA (as depicted in FIG.1, “84”).

As to Claim 2, Ziporovich further discloses wherein the code from the ADC is a code detect signal (as depicted in FIG.1, where the analog signal is passed to a FIR filter, then to a Viterbi detector, which detects the binary bit pattern represented by the digital signal using digital signal processing techniques).

As to Claim 4, Ziporovich further discloses wherein the code from the ADC is at least one digital output of the ADC (as depicted in FIG.1, and col.5, lines 50-61).

As to Claim 5, Ziporovich further discloses wherein the DAC circuit further comprises an analog processing device for providing a predetermined output signal to the VGA in response to a

DAC input (as depicted in FIG.1 (an output signal from DAC circuit “32” is provided to the VGA in response to an input received from the Digital Gain circuit “40”)).

As to Claim 6, Ziporovich further discloses an analog switch for providing a selection between input signals (as depicted in FIG.7, “162”; col.10, lines 18-37).

As to Claim 7, Ziporovich further discloses wherein the selection between input signals provides an output signal having predetermined high and low amplitudes (col.9, lines 49-col.10-3).

As to Claim 10, Ziporovich further discloses an analog processing circuit for receiving read signals (Fig.1, “21”); a digital-to-analog converter (DAC), coupled to the analog processing circuit for providing high and low control signals to the analog processing circuit for producing predetermined analog processing circuit output signals (as depicted in FIG.1, “30-34”); a variable gain amplifier (VGA), coupled to the analog processing circuit, for processing the predetermined analog processing circuit output signals using VGA gain codes for producing amplified signals (Fig.1, “20”); an analog-to-digital converter (ADC), coupled to the VGA, for producing an ADC code spread in response to the amplified signals (as depicted in FIG.1, “26”); memory for storing an amplitude of two input signals, the ADC code spread associated with the two input signals and two VGA gain codes associated with the two input signals and corresponding high and low DAC control signals (as depicted in FIG.1, “72”, “78”); and a processor, coupled to the memory, for calculating an amplitude of any input signal using an equation derived from the amplitude of the two input signals, the ADC code spread associated with the two input signals and the two VGA gain codes associated with the two input signals and corresponding high and low DAC control signals (as depicted in FIG.1, 66 & 84)

As to Claims 11-13 & 14-15,17-20, & 23-24 have limitations similar to those treated in the above rejections, and are met by the reference as discussed above. Claim 14, however also recites the

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following limitations which are also met by Ziporovich, "a magnetic storage medium for recording data thereon (as depicted in FIG.1, "12"); a motor for moving the magnetic storage medium (as depicted in FIG.1, 16"); a head for reading and writing data on the magnetic storage medium (FIG.1, "10"); an actuator for positioning the head relative to the magnetic storage medium (FIG.1, "16").

Allowable Subject Matter

3. Claims 3,8-9,16,21-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Cyrusian (US 6,519,103 B2) discloses a view DAC feedback inside analog front circuit.
- Abbott et al. (US 5,422,760) discloses a disk drive method using zoned data recording and PRML sampling data detection with digital adaptive equalization.
- Ziporovich (US 5,886,842) discloses control loops for low power high speed PRML sampling data detection channel.
- Perez et al. (US 6,507,297) discloses a system and method for variable gain coder-decoder.
- Haugland (US 4,635,142) discloses an amplitude sensor with adaptive threshold generation.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dismery E. Mercedes whose telephone number is 571-272-7558. The examiner can normally be reached on Monday - Friday, from 9:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on 571-272-7843. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dismery E Mercedes
Examiner
Art Unit 2651

DM 


DAVID HUDSPETH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600